Rese

VITAMIN AND OTHER ENRICHMENT

AND

FORTIFICATION

War Food Administration
Washington, D. C.
February 14, 1944

War Food Administration
Office of Distribution
Civilian Food Requirements Branch
Washington, D. C.

February 14, 1944

To: Dr. Elmer Alpert, Technical Adviser

From: Nora M. Kefauver, Home Economist

Subject: Report, "The History of Vitamin Enrichment and Other Fortification"

Submitted herewith is a report, "The History of Vitamin Enrichment and Other Fortification". This was written in accordance with your request. It is documented with research findings which are also here submitted in the form of eleven tabs.

Attachments

War Food Administration
Office of Distribution
Civilian Food Requirements Branch
Washington, D. C.

February 1, 1944

To: Robert S. Goodhart, M.D.
Chief, Nutrition in Industry Division and
Food Needs Division

From: Nora M. Kefauver, Home Economist
Food Needs Division

Subject: Report on study, "Vitamin and Other Enrichment and Fortification"

According to your assignment of December 28, 1943, on "Vitamin and Other Enrichment and Fortification", all of the proceedings of the National Research Council, Food and Nutrition Board, Volume III, which related to the subject were abstracted and placed into an outline. With these abstracts as a foundation, certain references were looked up in Volumes I and II, and in published Orders made by the Food and Drug Administration (printed in the Federal Register).

As a result, five tables have been compiled. They are:

Foods Adopted for Enrichment by NRC, Food and Nutr. Bd.
Foods Considered for Enrichment by NRC, Food and Nutr. Bd.
Foods Considered or Adopted as "Enrichers" by NRC, Food and Nutr. Bd.
Programs on Enrichment Noted by NRC, Food and Nutr. Bd.
Table of Requirements and Supply

Herewith are submitted the abstracts of NRC, Food and Nutr. Bd. III, and the five tables.

Attachments -

NKefauver/dep
CFRB-WFA-OD

VITAMIN ENRICHMENT AND OTHER FORTIFICATION

Foods Needs Division
Civilian Food Requirements Branch
Office of Distribution, War Food Administration

Washington, D. C.
February 14, 1944

FOREWORD

(and supplement)

Unfortunately the refining of grain in milling has gained acceptance in the United States. The people have learned to like white bread and polished rice, and the millers have found that the keeping qualities of germless and branless products are of commercial advantage. Such practice, however, is that of discarding 35 per cent of the grain and 75 to 100 per cent of its vitamins and minerals. These facts have been brought more clearly to light by the war. They are good explanations for the extensive prevalence of simple anemia and thiamin deficiency. Yet, the altering of existing milling practices involves the revolutionizing of an established industry and the introduction of new dietary habits, both of which are difficult in a democratic form of government. Therefore, the Government has attempted to compensate for some of these losses by putting nutrients back into the foods.

Since January 18, 1943, the compulsory enrichment of all commercial white bread, according to standards of the Food and Drug Administration, has been effective in the United States.* Since May 1, 1944, the compulsory enrichment of all commercial white rolls (according to existing bread standards) has been effective in the United States.** These orders were made legal by the Secretary of Agriculture and by the War Food Administrator who signed Food Distribution Order Number 1 and its amendments.

In peace-time, however, the validity of this enrichment program (and others being planned) will depend upon Congress. This report was prepared to be used in an appeal to Congress for legislation favoring the enrichment of food in post-war years.

The ultimate goal is to change the food habits of the American People so that they will prefer unrefined foods, especially whole wheat, and so that the enrichment of foods will not be necessary.

Nora M. Kefauver

*Federal Registers: 7, December 31, 1943, pp. 11105; 8, December 15, 1943, pp. 16777; and January 15, 1944, pp. 599. (see tab 12)
**Federal Register: 9, April 29, 1944, pp. 4527. (see tab 12)

VITAMIN ENRICHMENT AND OTHER FORTIFICATION

History of Enrichment

by Nora M. Kefauver

Enrichment of foods is the greatest event in the twentieth century for the nutritional health of the American people. It was born out of the present war and should not be abandoned with the armistice. It is a compensation for the destruction of vital food elements lost by way of industrial processing and refining.

Today only 65 percent of the wheat grain remains in average flour. Corn meal is degerminated; grits and hominy are "undressed". Rice is polished. Certain population groups eat quantities of macaroni and related products. Endemic goiter was prevalent before the addition of iodine to salt. Whole wheat bread is seldom 100% whole wheat and its consumption in the United States is only 2 percent.

*For years, wheat has contributed at least one-fourth of the calories to the average American diet. White flour constitutes 95 percent of the milled wheat products in this diet; and yet, by nature of its refining process, from 80 to 90 percent of the micro-nutrients (thiamin, niacin, and iron) are lost. The American people prefer white bread, and the changing of food habits in a democratic system of government is difficult.

**The Russian Army is fed whole grain. It has been the most able army in combat with the whole grain-eating Nazis. The governmental authorities in England have authorized a national wheat meal which retains 85 percent of the wheat and which is enriched with calcium carbonate.

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*Wilder, Russell M., Chief, Civilian Food Requirements Branch, Food Distr. Adm., War Food Adm., July 21, 1943. (See tab. 11, pp 33)
**Journal of American Dietetic Association, April, 1942, "Why Enriched Bread?", by Williams, Robert R., and Russell M. Wilder. (See tab 11, pp 17)
pp. 225-229

VITAMIN ENRICHMENT IN GRAIN ADMINISTRATION

History of Enrichment

by Mary E. Pedersen

Enrichment of bread is the greatest event in the twentieth century for the nutritional health of the American people. It was born out of the present war and should not be considered with the wartime. It is a preparation for the conservation of vital food elements lost by way of industrial processing and refining.

Today only 65 percent of the wheat grain remains in average flour. Corn meal is degerminated; grits and hominy are "undressed". Rice is polished. Certain complication arises as quantities of enriched and related products. Endosperm gluten was prepared before the addition of vitamins to milk. Whole wheat bread is called 100% whole- wheat and its consumption in the United States is only 2 percent.

*For years, wheat has constituted at least one-fourth of the calories in the average American diet. While flour constitutes 80 percent of the milled wheat products in this diet; and yet, by nature of its refining process, from 80 to 90 percent of the micro-nutrients (thiamin, niacin, and iron) are lost. The American people prefer white bread, and the adaptation of food habits in a democratic system of government is difficult.

**The Russian army is fed whole grain. It has been the most alive army in contact with the whole grain-eating Nazis. The governmental authorities in England have authorized a national wheat meal which retains 85 percent of the wheat and which is enriched with calcium carbonate.

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*Milner, Russell E., Major, "Milling for Requirements Branch, Food Distr. Adm., War Food Adm., July 21, 1943. (See bib. 11, pp 59)
**Journal of American Dietetic Association, April, 1942, "Why Enriched Bread", by Williams, Robert R., and Russell E. Milner. (See bib 12, pp 17)

The United States offers enriched bread for consumer choice, and it revels in the entree of compulsory enrichment for all family flour.

*The policy of the Food and Drug Administration concerning the enrichment of foods was adopted on July 1, 1943. It states that, because of the existance of processed foods, and because of the limited education of consumers relative to choice of nutritious foods, it is necessary to fortify certain foods which are commonly consumed. The vitamins and minerals added to these foods should replace the loss of such elements by processing, and should also provide a reasonable measure of safety from deficiencies of them. The foods used for fortification are those which have lost nutrients by modern refining processes. Cognizance of the fact that nutrition information is incomplete and is in the developmental stage is noted.

The development of this policy became necessary as the existing nutritional deficiency in the United States became evident. On Oct. 1, 1941, the Committee on Food and Nutrition, National Research Council, acknowledged a request received from the Food and Drug Administration concerning a suitable policy of fortification of foods which can be applied consistently as the program of standardization progresses. **The National Research Council adopted a policy at this time which endorses addition of specific nutrients to staple foods which are effective vehicles for correcting dietary deficiencies, and which favors the use of natural foods, and ~~of~~ which favors improving processes for manufacturing food which will be less destructive of nutritive values. It prefers that vehicles of fortification be those foods which are deprived of nutrients by the manufacturing process,

*Federal Register, July 3, 1943, pp. 9170 (see tab 1)
**Proceedings of the National Research Council, Committee on Food and Nutrition, Vol. 1, Oct. 1, 1941, pp. 192-3 (see tab 2)

the United States offers excellent areas for commercial choice, and it rewards in the choice of adequate, nutritious foods for all family members.

*The policy of the Food and Drug Administration concerning the nutritional foods are adopted on daily basis. It ensures that, manner of the addition of processed foods, and because of the limited amounts of necessary nutrients in diets of individual foods, it is necessary to fortify certain foods which are nutrically necessary. The vitamins and minerals added to these foods should replace the loss of such elements by processing, and should also provide a reasonable margin of safety from deficiencies of them. The forms used for fortification and those which have just materials by modern nutritic processes. Adequacy of in fact that nutrition is complex. It incomplete and is in the developmental stage it today.

The development of this policy therefore necessary if the existing nutritional deficiency in the United States cannot exist. On May, 1, 1941, the Committee on Food and Nutrition, National Research Council, acknowledged a request received from the Food and Drug Administration concerning a suitable policy of fortification of foods which can be applied consistently as the program of standardization progresses. The National Research Council adopted a policy at this time with endorsed addition of specific nutrients to staple foods which are effective vehicles for correcting dietary deficiencies, and which favor the use of natural foods, and artificial flavor improved processes for manufacturing food which will be less destructive of nutritive values. It confirms that vehicles of fortification be from food which are deficient of nutrients by the manufacturing process.

Federal Register, July 2, 1943, p. 9170 (see lab 1)
Proceedings of the National Research Council, Committee on Food and Nutrition, Vol. 3, Feb. 2, 1941, no. 3(see lab 2)

and it recommends that added nutrients be of the kind and quantities native to the foods being fortified. Other than natural levels of enrichment should be used only when dietary deficiencies require added nutrients by some channel.

Within this policy, certain foods are specified for fortification. These are: flour and bread, milk with vitamin D, table fats with vitamin A, and salt with iodine. *On February 20, 1943, the National Research Council, Food and Nutrition Board, adopted resolutions endorsing the following other measures of enrichment: The addition of skim milk solids to bread (6 parts per 100 parts flour); the enrichment of all flour for family consumption; and the enrichment of corn meal and grits.

**The Food and Nutrition Board noted the need ~~of~~ for increased production of certain vitamins since the war increases demands of them, both for human consumption and for the feeding of farm animals. Therefore the Board adopted a resolution recommending the expanded production of ascorbic acid, riboflavin, and niacin; and the maintenance of existing production of vitamins A, B_1, and D. This recommendation gave preference in allocation of vitamins in short supply in the following order: 1. Medical treatment and investigative purposes; 2. The food enrichment program; 3. The feeding of farm animals; 4. Addition to other foods than those of enrichment program; and 5. Over the counter sales to the public.

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*Proceedings of the National Research Council, Food and Nutrition Board, Vol. III, Feb. 20, 1943, pp. 45-50 (see tab 3)
**Ibid, April 6, 1943, pp. 62-3 (see tab 4)

and it recommends that added nutrients be of the kind and quantities
necessary to the foods being fortified. Other than natural vitamin
supplement should be used only when dietary deficiencies require added
nutrients by some channel.

Within this policy, certain foods are specified for fortification.
These are: flour and bread, milk with vitamin D, butter fats with
vitamin A, and salt with iodine. On February 20, 1945, the National
Nutrition Council, from one hundred Board, adopted resolutions
endorsing the following other measures of enrichment: The addition of
skim milk solids to bread (1 parts per 100 parts flour); the enrichment
of all flour for family consumption; and the enrichment of corn meal
and grits.

**The Food and Nutrition Board noted the need of increased production of
certain vitamins alone but may increased demands of them, not for
human consumption and for the feeding of farm animals. Therefore the
board adopted a resolution recommending the expanded production of
ascorbic acid, riboflavin, and niacin; and the maintenance of existing
production of vitamins A, B_1, and D. This recommendation gave preference
was in allocation of vitamins in short supply in the following order:
1. Medical treatment and investigative purposes; 2. The food enrichment
program; 3. The feeding of farm animals; 4. Addition to baby foods than
those of enrichment program; and 5. Over the counter sales to the public.

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*Proceedings of the Nutrition Council, Food and Nutrition Board,
Vol. XIX, Jan. 20, 1945, pp. 15-20 (see Ser 2)
**Ibid, April 5, 1945, pp. 85-x (see Ser 2)

In addition to synthetic vitamins, vitamin concentrates, and minerals, certain foods are also used for enriching foods. The most prominent of these are skim milk solids, yeast, and soybeans.

In the interest of increasing the production of skim milk solids, the Food and Nutrition Board adopted a resolution that the large supplies of milk now on farms and not being used for human consumption be allocated, in part, for this purpose. * The milk now fed to farm animals can be replaced in their diets by adequate foodstuffs.**

Before the present war program began, two-thirds of the brewers' yeast produced went into animal feed. Its increased use as a fortifying substance is being considered.*** Although soybeans are not of great value for vitamin enrichment, soy flour as a protein supplement is being used extensively.****

To date, certain foods have been adopted for enrichment by the Food and Nutrition Board. These are:*****

Flour (compulsory--all family flour)
Bread (compulsory--all bread labeled "Enriched")
Corn Products (corn meal and grits)
Rice
Farina (compulsory--all farina labeled "Enriched")
Margarine (compulsory--all margarine for table use)
Milk (compulsory--all relief milk)
Salt (compulsory - all salt labeled "Iodized.")

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*Proceedings of the National Research Council, Food and Nutrition Board, Volume III, May 27, 1943, pp. 165.
**Ibid, pp. 167
***Ibid. pp. 401
****Ibid, pp. 211
*****Proceedings of the National Research Council, Food and Nutrition Board, Vol. I, 1941; and Vol. III, 1943, pages are here given in order of foods listed: III, 50; III, 50;III, 50; III, 323; III, 193; III, 99; III, 95 (and I, 193); I, 193. (see tab 7)

*The Food and Drug Administration has enacted legislation specifying the amounts of nutrients to be added to Flour, Bread, Farina, and Margarine. These proposed standards are in accord with the Food and Nutrition Board's views. A supplementary sheet is attached which shows the exact specifications for enrichment of these foods as endorsed by both organizations. This supplementary sheet also shows the levels approved and adopted by the Board for Corn Products, Rice, Milk, and Salt. (If action has been taken on these by the Food and Drug Administration, it is unknown to the author.)

**Bakery bread may be enriched by the use of enriched flour, by addition of nutrients to the mix, or by the use of high vitamin B yeast in the mix. A daily consumption of six slices of enriched bread, made by either of these methods or made at home with enriched flour, will give the following percentages (at least) of the National Research Council's Recommended Daily Dietary Allowances for the respective nutrients:

***Thiamine - 23%; Niacin - 21%; Iron - 25%; Riboflavin - 10%; Calcium - 14%; vitamin D - 14%; (Ca. & vit. D are optional.)

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*(See tab 7)
**Federal Register, August 3, 1943, pp. 10786
***(see tab 11, appendix 1)

The food and Drug Administration has received legislation amendments by [illegible] of [illegible] - a model to Flour, Bread, Butter, and Margarine. These proposed amendments are in accord with the Food and Drug Act's views. A supplementary sheet is attached which shows the exact qualifications for enrichment of these foods as endorsed by both organizations. This supplementary sheet also gives the levels approved and adopted by the Board for Lean Pork, Olive, Milk, and Eggs. (If action has been taken to these by the Food and Drug Administration, it is unknown to the writer.)

Vitamin bread may be obtained by the use of enriched flour, by addition of vitamins to the mix, or by the use of some vitamin C [illegible] in the mix. A daily consumption of six slices of enriched bread, made by either of these methods or made with enriched flour, will give the following percentages (of Lewis) of the Minimal Amount Desired, Recommended Daily Dietary Allowance for the respective vitamins:

**Thiamine - 37%; Niacin - 90%; Iron - 75%; Riboflavin - 10%; Calcium - 10%; Vitamin A - 10% (Ca. & Vit. - not required.)

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*(Over one [illegible])
*Nutrient Dr. Index Journal 8, 1942, Pp. 12704
*Nutrient (at 11, appendix 1)

A per capita daily consumption of 3 ounces of fortified margarine will furnish approximately 2/5 of the Recommended Daily Dietary Allowance of vitamin A.* One quart of fortified relief milk will provide the total Recommended Allowance of vitamin D.** Enriched farina furnished the same nutrients in kind and quality as enriched bread and flour except that (since it is used for children) the minimum for iron is raised, and vitamin D is a required nutrient. *** Salt is being fortified with iodine to 0.01 percent.****

Many foods have been considered, or are being considered, for enrichment. These are: *****

Macaroni and Related Products (refused by Board because of loss of nutrients in leaching.).
Reference Mixed { Vitamized Chocolate Bar
~~Evaporated~~ Milk (organizations, other than the Board, have approved its fortification for foreign civilian diets).
Salt with Ca, P. and Fe.
Margarine (with vitamin D (this is being done in England)).******
Baking Powder (with B vitamins).
Chewing Gum (with vitamin K to prevent dental caries).
Alcoholic and Soft Drinks (Board opposes enrichment as they are relatively non-essential foods).
Candy (Board opposes enrichment as so doing may stimulate increased consumption).
Ice Cream (not approved by Board).
Sugar.

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*Proceedings of National Research Council, Foods and Nutrition Board, Vol. III, April 6, 1943, pp. 99.
**~~Ibid, pp. 95.~~ Proceedings of Natl. Research Council, F.&N.Bd., Vol II, Aug 24, 1942, pp. 95
***Federal Register, June 5, 1943, pp. 7514.
****Proceedings of: op. cit., Vol. I, July 26, 1941, pp. 172 (see tab 8)
***** Proceedings of National Research Council, Food and Nutrition Board, Volumes I, II, and III, pages are here given in order of foods listed: III, 323; III, 397; II, 126; III, 307; III, 3; III, 458; I, 193; I, 193; III, 463; and I, 224 (see tab 8)
******Proceedings of: op. cit., Vol. III, 1943, pp. 155

In March 1943, from 75 to 80 percent of margarine was being enriched.* In July 1941, 50 percent of salt was being iodized.** Today the bakers are enthusiastic in promoting their "enriched" bread, and the compulsory enrichment of all family flour is receiving final approval. Enrichment for corn products and rice is gaining acceptance.

The cost of enriching bread is largely being borne by the bakers. The millers and blenders of enriched flour may charge 17 cents per hundred-weight over the ceiling price for un-enriched flour. This amounts to 34 cents per barrel of 200 pounds. Enriched bread is not sold at a premium, because this would defeat the purpose of reaching the low-income groups.*

The results of enrichment may be more clearly seen if porjects being carried on in factories are studied.***** A nutrition program in Puerto Rico is being considered experimental.****** Training fellowships for post-war nutrition work abroad are being awarded by the Rockefeller Foundation.*******

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*Proceedings of National Research Council, Food and Nutrition Board, Vol. III, April 6, 1943, pp. 99 (see tab 6)
**Ibid, Vol. I, July 26, 1941, pp. 172 (see tab 7)
***Office of Price Adm. Amendment 8 to MPR 296 (see tab 11, page 37)
****Transcription of Discussion held by American Bakers and Millers in Chicago, March 5, 1941, pp. 12 (see tab 11, page 36)
*****Proceedings of National Research Council, Food and Nutrition Board, Volume III, Oct. 16, 1943, pp. 433-451 (see tab. 10)
******Ibid, pp. 422 (see tab 10)
*******Ibid, pp. 320 (see tab 10)

In March 1943, from 75 to 80 percent of purchase was being enriched.* In July 1941, 60 percent of salt was being iodized.** Today the bakers are enthusiastic in promoting their "enriched" bread, and the compulsory enrichment of all family flour is receiving final approval. Enriched dry corn products and rice is minimal accordance.

Little cost of enriching bread is largely being borne by the bakers. The millers and jobbers of enriched flour say about 17 cents per hundred-weight over the selling price for un-enriched flour. This amounts to 34 cents per barrel of 196 pounds. Enriched bread is not sold at a premium, because this would defeat the purpose of reaching the low-income groups.***

The results of enrichment may be more clearly seen if periods being carried on in factories are studied.**** A nutrition program in Fords also is being continued successful.***** Training facilities for post-war nutrition work abroad are being awarded by the nutritionists association.******

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*Proceedings of National Research Council, Food and Nutrition Board, Vol. III, April 5, 1943, pp. 80 (see tab 8)
**Wind, Vol. I, July 26, 1941, pp. 172 (see tab 9)
***Office of Price Adm. Announcements & to Ave Ser (see tab 12, page 37)
****Concentration of Distribution Mill by Industry Sizes and Utilized in Chicago, Bard 3, 1941, pp. 12 (see tab 12, page 30)
*****Proceedings of National Research Council, Food and Nutrition Board, Volume III, Oct. 14, 1944, pp. 44-48 (see tab. 17)
******Ibid, pp. 482 (see tab 10)
*******Ibid, pp. 280 (see tab 10)

Vit. Enr./8

Attached herewith is a table of the civilian vitamin requirements in the United States for 1943.* For 1944, plans are made to maintain the present production of vitamins A, D, and B_1, and a request for increased production of ascorbic acid, riboflavin, and niacin has been approved by the National Research Council.** Another table shows production and consumption figures for foods concerned in the enrichment program.***

Documentation of all footnotes is herewith submitted in abstract form in reports of the following order:****

Foods Adopted for Enrichment.
Foods Considered for Enrichment.
Foods Considered or Adopted as "Enrichers".
Programs on Enrichment.
Cereals--Whole, Processed, Enriched.

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* (see tab 5)
**Proceedings of National Research Council, Food and Nutrition Board, Vol. III, April 6, 1943, pp. 62-63 (see tab 4)
***(See tab 6)
****(See tabs 7, 8, 9, 10, and 11) and others

NKefauver
Food Needs Division, Civilian Food Req. Br., O.D.
2-14-44

Attached hereto is a table of the civilian vitamin requirements in the United States for 1943.* For 1944, plans are made to maintain the present production of thiamine B_1, B_2 and B_3, and a request for increased production of ascorbic acid, riboflavin, and niacin has been approved by the National Research Council.** Another basis since introduction and accompanying figures for foods considered in the enrichment program.***

Documentation of all footnotes is herewith submitted in abstract form in regards of the following overview:**

Foods Adopted for Enrichment.
Foods Considered for Enrichment.
Foods Considered or Adopted as "Enriched".
Programs or Enrichment.
Cereals--Whole, Processed, Enriched.

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* (see tab 3)
**Proceedings of National Research Council, Food and Nutrition Board, Vol. III, April 8, 1943, pp. 63-68 (see tab 4)
***(See tab 5)
****(See tab 7, 8, 9, 10, and 11)

Respectfully
Food Chain Division, Civilian Food Req., Wa., D.C.
E-Lipke

TABS

VITAMIN ENRICHMENT AND OTHER FORTIFICATION

TABS

1. Statement of policy with respect to the addition of nutritive ingredients to foods--by Federal Security Agency, Food and Drug Administration. 1943
2. Statement of policy in the matter of addition of specific nutrients to foods--National Research Council, Committee on Food and Nutrition. 1941
3. Resolution adopted concerning enrichment of foods--National Research Council, Food and Nutrition Board. 1943
4. Recommendations adopted regarding synthetic vitamins for civilian use--National Research Council, Food and Nutrition Board. 1943
5. Civilian Vitamin Requirements estimated for 1943 (distribution) in the United States.
6. Table of production and consumption of foods concerned in the enrichment program.
7. Foods adopted for enrichment by National Research Council, Food and Nutrition Board.
8. Foods considered for enrichment by National Research Council, Food and Nutrition Board.
9. Foods considered or adopted as "enrichers" by National Research Council, Food and Nutrition Board.
10. Programs on Enrichment noted by National Research Council, Food and Nutrition Board.
11. Cereals--Whole, Processed, Enriched, by Nora M. Kefauver → (Separate Report also in Agr. Library)
12. Excerpts from Food Distribution Orders, Dept. of Agr., relative to bakery products.

Excerpts from Food Distribution Orders, Dept of Agr.
relative to bakery products.

*STATEMENT OF POLICY WITH RESPECT TO THE
ADDITION OF NUTRITIVE INGREDIENTS TO FOODS
BY
FEDERAL SECURITY AGENCY, FOOD AND DRUG ADMINISTRATION

July 1, 1943

"The labeling or advertising of a food as enriched with vitamins and minerals is an implied promise to consumers that it contains, in addition to the normal constituents of the unenriched food, sufficient vitamins and minerals to make a substantial contribution to the nutritional welfare of persons eating the enriched food in customary amounts. In order to promote honesty and fair dealing by fulfilling this implied promise, it is necessary that the kinds and quantities of enriching ingredients be determined in the light of deficiencies of the various nutritional factors in the diets of the population in general and of significant population groups, the place occupied by the food in such diets, and the suitability and effectiveness of the food as a carrier of the enriching ingredients without undue separation or loss before consumption.

"Honesty and fair dealing will best be promoted if such enriched foods as are made available to consumers serve to correct such deficiencies and furnish a reasonable margin of safety. Enrichment above the levels required to accomplish this and is wasteful and contrary to the interest of most consumers; nutrient factors in concentrated form are available for use in those special cases of deficiencies in the diets of persons who do not constitute significant population groups. Enrichment of foods with nutrients that are supplied in adequate quantities by the diets of all significant population groups is not only wasteful but tends to confuse consumers as to their nutritional needs.

"Knowledge of the roles in human nutrition of various components of food, particularly the vitamins, is incomplete. There is reason to believe that as new information is developed food factors not now recognized as essential may be shown to be necessary to adequate nutrition.

"Most natural foods contain a wide variety of needed factors in significant amounts. It is highly probable that diet of unenriched foods so chosen as to contain the required quantities of the presently known needed vitamins and other factors would more nearly supply all needed factors, known and unknown, than a diet which is raised by enrichment to adequancy in the vitamins and minerals now known to be needed.

*Federal Register, July 3, 1943, pp. 9170

"Even though adequate nutrition could be better assured through the choice of natural foods than through reliance on enrichment, unenriched foods of the kinds and in the quantities necessary for adequate nutrition are not now available to substantial parts of the population and are not likely to be available soon; nor are most consumers sufficiently educated on nutritional questions to enable them to make an intelligent choice of combinations of unenriched foods on the basis of nutritional values.

"Because of the lack of adequate production of a number of foods high in certain nutrients and the lack of consumer knowledge of nutrition, appropriate enrichment of a few foods widely consumed by the population in general or by significant population groups will contribute substantially to the nutritional welfare of consumers and to meeting their expectations of benefit. Enrichment of those foods which are not a substantial part of the dietary of any significant group tends to confuse and mislead consumers through giving rise to conflicting claims of nutritional values and by creating an exaggerated impression of the benefits to be derived from the consumption of such foods.

"If the customary process of manufacturing a staple food refines it so as to remove significant quantities of nutritive factors present in the natural product from which the food is made, and if the refined food is a suitable and efficient carrier of the factors so removed some nutritionists advocate the restoration of such factors to the levels of the natural product as the most desirable basis of enrichment. To the extent that restoration serves to correct deficiencies of such factors, it is consistent with the promotion of honesty and fair dealing that refined foods be enriched on a restoration basis. However, when the evidence shows that the restoration levels are too low to correct deficiencies, or that deficiencies exist in other factors for which the refined food is an efficient carrier, the promotion of honesty and fair dealing may require the inclusion of corrective quantities of nutritive factors in the enriched food even though such factors are present in smaller quantities or wholly lacking in the natural product from which the food is made. Similar considerations may require the enrichment of unrefined foods."

(SEAL)

WATSON B. MILLER
Acting Administrator.

July 1, 1943.

(F.R. Doc. 43-10655; Filed, July 2, 1943;
11:13 a.m.)

*STATEMENT OF POLICY IN THE MATTER OF ADDITION OF SPECIFIC NUTRIENTS TO FOODS
BY
NATIONAL RESEARCH COUNCIL, COMMITTEE ON FOOD AND NUTRITION

October 1, 1941

"WHEREAS there exists deficiencies of vitamins and minerals in the diets of significant segments of the population of the United States which cannot promptly be corrected by public education in the proper choice of foods, be it resolved, in order to correct and prevent such deficiencies:

"(1) That the Committee endorse the addition of specific nutrients to staple foods (as indicated under 6 below) which are effective vehicles for correcting the above deficiencies in the diets of the general population or of significant age, geographic, economic or racial segments thereof;

"(2) That the Committee opposes the inclusion of additions of specific nutrients under definitions and standards which may be promulgated under the Food, Drug and Cosmetic Act except in the case of foods which constitute such effective vehicles of distribution;

"(3) That the Committee favors unequivocally the fulfillment of the nutritional needs of the people by the use of natural foods as far as practicable and to that end encourages education in the proper choice of foods and the betterment of processes of food manufacture and preparation so as to retain more fully the essential nutrients native thereto;

"(4) That to avoid undue artificiality of food supply the Committee favors, whenever practicable, the choice as vehicles for the corrective distribution of vitamins and minerals those foods which have suffered losses in refining processes and recommends that the vitamins and minerals added to such foods should preferably be the kinds and quantities native thereto in the unrefined state;

"(5) That the addition of other than natural levels of vitamins and minerals to foods which are suitable as vehicles of distribution may be sanctioned when more natural routes are practically unavailable as measures to correct knownnutritional deficiencies;

"(6) That at present the Committee favors appropriate enrichment of flour and bread (and perhaps corn meal), the fortification of milk with vitamin D, the suitable addition of vitamin A to table fats and of iodine to salt for dietary use. There is no information available to the Committee at the present time which indicates that it will be desirable to recommend the addition of vitamins and minerals to foods other than those named;

"(7) That specifically the Committee opposes the addition of synthetic vitamins to carbonated beverages and confectionary."

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*Proceedings of the National Research Council, Committee on Food and Nutrition, Volume I, October 1, 1941, pp. 192-193.

*National Education Association, Committee on Food and Nutrition.

October 1, 1942

"Whereas there exists deficiencies of vitamins and minerals in the diets of significant segments of the population or the control thereof cannot properly be accomplished by public education in the proper choice of foods, it is resolved, in order to normal and prevent such deficiencies:

"(1) That the Committee endorses the addition of specific nutrients to staple foods (as indicated below & below) which are effective vehicles for correcting the above deficiencies in the diets of the general population or of significant age, geographic, economic or ethnic segments thereof;

"(2) That the Committee approves the fortifying of additives or specific nutrients under controlled and adequate safeguards in proportion which has fact, long and thoroughly tested in the need of food and nutrition additive and effective vehicles of dietetic foods;

"(3) That the combined efforts specifically the utilization of the restricted needs of the people by the use of natural foods in the so practical and to this end recommend activities in the public education of foods and the betterment of processes of food manufacture and preparation so as to provide more fully the essential substance within foods;

"(4) That to apply more specifically of and apply the [illegible] factors, however provided, the choice as vehicles for the enrichment of the diet of students and children these foods which have sufficient lapse in medical research and recommendations that the vitamins and minerals which in most foods should primarily be the iron and vitamins which therefore in the enrichment foods;

"(5) That the addition of other than natural foods of vitamins and minerals to foods which are suitable as vehicles of distribution may be accomplished under some medical control practically practicable to provide to market homogenized fortified foodstuffs;

"(6) That we present the Committee foods appropriate enrichment of flour and bread (and perhaps corn meal), the fortification of milk with vitamin D, the suitable addition of vitamin A to table fats and of iodine to salt for dietary use. There is no information available to the Committee at the present time which indicates that it will be desirable to recommend the addition of vitamins and minerals to foods other than those named;

"(7) That specifically the Committee approves the addition of [illegible] vitamins to cereals and beverages and confectionery."

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*Proceedings of the National Research Council, Committee on Food and Nutrition, Volume I, October 1, 1942, pp. 183-185.

*RESOLUTION ADOPTED CONCERNING ENRICHMENT OF FOOD
BY
NATIONAL RESEARCH COUNCIL, FOOD AND NUTRITION BOARD

February 20, 1943

"The Food and Nutrition Board favors:

"1. Immediate compulsory enrichment of all family flour.

"2. Amendment of Food Administration Order No. 1 to require minimum levels of thiamine, niacin(nicotinic acid or nicotinamide) and iron in enriched bread to levels recommended at the Bread Hearings of July-August, 1941; namely, thiamine 1.1 milligrams, niacin 10 milligrams and iron 8 milligrams per pound of bread.

"3. Adjustment of the minimum levels of thiamine, niacin and iron in enriched flour to conform to testimony given at the Bread Hearings of July-August, 1941; namely, thiamin 2 milligrams, niacin 15 milligrams and iron 12 milligrams per pound of flour, these requirements being within the range of levels specified in the regulations defining enriched flour under the Food, Drug, and Cosmetic Act.

"4. Early inclusion of riboflavin as a required ingredient of enriched flour in the minimum amount of 0.6 milligrams per pound of enriched flour, said amount to be increased to 1.2 milligrams per pound as soon as the available supply of riboflavin permits, and at that time 0.7 milligrams of riboflavin be required as a minimum for enriched bread.

"5. The extension of enrichment to corn meal and grits in harmony with the enrichment program as soon as proper standards and techniques can be formulated."

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*Proceedings of the National Research Council, Food and Nutrition Board, Volume III, February 20, 1943, pp. 50.

[illegible]

[illegible]

[illegible]

February 20, 1958

The Honorable [illegible]

Dear [illegible]:

[illegible]

[illegible]

[illegible]

*RECOMMENDATIONS ADOPTED REGARDING SYNTHETIC VITAMINS FOR CIVILIAN USE
BY
NATIONAL RESEARCH COUNCIL, FOOD AND NUTRITION BOARD

April 6, 1943

"The Food and Nutrition Board of the National Research Council recommends that measures be taken:

a). To increase the production of ascorbic acid, riboflavin, and niacin (or its amide);

b). To maintain the production of vitamins A, B_1, and D;

c). To give preference in the allocation of all vitamins in which shortages may appear, in the following order:

1. For the treatment and prevention of human disease under medical supervision, and for investigative purposes.

2. For the Food Enrichment Program as recommended by the Food and Nutrition Board of the National Research Council.

3. For the feeding of farm animals necessary for the production of human food.

4. For addition to human foods not included in the food enrichment program.

5. For over-the-counter sales to the general public.

Be it further resolved that these recommendations be brought to the attention of the appropriate government agency or agencies."

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*Proceedings of the National Research Council, Food and Nutrition Board, Vol. III, April 6, 1943, pp. 62-63

*RECOMMENDATIONS ADOPTED REGARDING ECONOMIC VITAMINS FOR ANIMAL USE

by

NATIONAL RESEARCH COUNCIL, FOOD AND NUTRITION BOARD

April 6, 1962

"The Food and Nutrition Board of the National Research Council recommends that manufacturers be asked:

a). To increase the production of ascorbic acid, riboflavin, and choline (or its salts);

b). To maintain the production of thiamine hcl, B12, and D;

c). To give preference in the allocation of all vitamins to which shortages may arise, in the following order:

1. For life saving and prevention of human disease under medical supervision, and for investigative purposes.

2. For the food fortification programs as recommended by the Food and Nutrition Board of the National Research Council.

3. For use feeding of farm animals necessary for the production of human food.

4. For addition to human foods not included in the food fortification programs.

5. For supplementation of pets or the general public.

d). Further consider this issue recommendations to consult the chairman of the appropriate governmental agency or agencies."

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*Proceedings of the National Research Council, Food and Nutrition Board, Vol. III, April 6, 1962, pp. 62-63

*CIVILIAN VITAMIN REQUIREMENTS, ESTIMATED FOR 1943 (Distribution) IN THE UNITED STATES

Vitamin A	Supplies adequate for all purposes
Vitamin D	Supplies adequate for all purposes
Ascorbic Acid	150,000 pounds (but for the first three to six months before limit of 50,000 pounds per year becomes effective)

	Total	For Fl. and Bd.	For Corn Meal	For Bkf.Cereals	For Medicinal, and Specialty Uses	For Food
Thiamin	103,000 lbs.	60,000 lbs.	5,000 lbs.	3,000 lbs.	35,000 lbs.	-
Riboflavin	56,000 lbs.	30,000 lbs.	6,000 lbs. and other cereals		20,000 lbs.	-
Niacin	700,000 lbs.	500,000 lbs.	70,000 lbs.		100,000 lbs.	30,000 lbs. and other products

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*Proceedings of the National Research Council, Food and Nutrition Board, Volume III, January 15, 1943, pp. 37.

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[illegible] [illegible] [illegible] [

*PRODUCTION AND CONSUMPTION OF FOODS CONCERNED IN THE ENRICHMENT PROGRAM

Product	Pounds Produced in 1941 millions	1942	1943 billions	Estimated Production for 1944 millions of lbs.	Lbs. Potentially Available millions	% of Planned Increase	Per Capita Minimum Daily Dietary Requirements	Per Capita Consumption	Percent Being Fortified or Being Used to Fortify	Specifications for Fortifications Being Used	Specifications for Fortification Being Used-Foreign Countries	Daily Requirements Per Adult of Important Vitamins or Minerals Concerned	Per Capita Supply	Per Capita Consumption	Effectiveness of Enrichment
Skimmilk Powder	476				4,945										
Buttermilk Powder	75				264										
Whey Powder	110				560										
Whole Milk Powder	47														
Total	708				5,769										
Fat						Margarine to 180%	68 - 40 lbs. (annual) (28 lbs. from visible fat)		(For bread - (6 parts to (100 parts of (flour-as soon (as solids are (available)	75 - 80% of Oleo., March'43	9000 Units of A per lb.	(English fortified (Margarine -- (8800 IU of A per lb. (480 IU of D per lb. (D to be raised to (600 or 700 units (per lb.	4,600 IU for A (N.R.C.)	6,500 for 1943, A	6800 IU, 1942 for A	(Not equivalent (to butter because of difference in absorption of low and (high fatty acids
Salt											1 part potassium iodide or equivalents per 10,000 parts of salt		Requirement of iodine was reformed June 7, 1942 to allow 0.15 to 0.30 mg per adult				
Milk Fluid			120 (goal)												
Yeast				Dried Brewer's Yeast - 20	25 surplus Brewer's Yeast annually 18 Dried yeast annually	Primary yeast (Beet molasses) Could be doubled	2 to 4 ts. daily will supply good share of B-vitamins								
Total Cereals								235 lbs in South Carolina							

*Proceedings of National Research Council, Food and Nutrition Board, from various places in Volumes I, II, and III.

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FOODS ADOPTED FOR ENRICHMENT
BY
NATIONAL RESEARCH COUNCIL, FOOD AND NUTRITION BOARD
(Proceedings: Vol. I, II, & III)

FLOUR AND BREAD:

I, 193 (Oct. 1) 1941 - Enrichment of flour and bread approved and adopted.

*III, 50 (Jan. 15) 1943 - Resolutions were made and adopted favoring immediate compulsory enrichment of all family flour; fortification of enriched flour and bread at levels recommended by the Board in 1941; and inclusion of riboflavin as a required ingredient in enriched flour and bread as soon as supplies are available.

*III, 193-4 (July 30) 1943 - Food and Drug Administration's published proposals (in Federal Register, June 5, 1943) of revised standards for flour and bread enrichment were substantially in accord with the Board's views.

*Proposals as passed and published by the Food and Drug Administration are here given as taken from the following sources:

Flour Standards: Fed. Register, May 27, 1941, page 2580.
Fed. Register, July 3, 1943, page 9116.

Bread Standards: Fed. Register, June 7, 1941, page 2772.
Fed. Register, Aug. 3, 1943, page 10787

Units Added per Pound of Flour

FLOUR	ENACTED 1941 Minimum	ENACTED 1941 Maximum	AMENDED 1943 Minimum	AMENDED 1943 Maximum
Thiamin	1.66 mg	2.5 mg	2. mg	2.5 mg
Niacin	6. mg	24. mg	16. mg	20. mg
Iron	6. mg	24. mg	13. mg	16.5 mg
(a) Riboflavin	1.2 mg	1.8 mg	1.2mg	1.5 mg
(Calcium	500. mg	2000. mg	500. mg	625. mg
Optional (Vitamin D	250. USP	1000. USP	250. USP	1000. USP

(Wheat Germ It may contain not more than 5 percent by weight of wheat germ or partly defatted wheat germ.

Units Added per Pound of Bread

BREAD	ENACTED 1941 Minimum	ENACTED 1941 Maximum	AMENDED 1943 Minimum	AMENDED 1943 Maximum
Thiamin	1. mg	4. mg	1.1 mg	1.8 mg
Niacin	4. mg	16. mg	10. mg	15. mg
Iron	4. mg	16. mg	8. mg	12.5 mg
(a) Riboflavin	0.8 mg	3.2 mg	0.7 mg	~~0.1~~ mg 1.6
(Calcium	333. mg	1333. mg	300. mg	800. mg
Optional (Vitamin D	160. USP	640. USP	150. USP	750. USP

(Wheat Germ Each such food may also contain as an optional ingredient wheat germ or partly defatted wheat germ; but in no case is the total quantity thereof more than the maximum which may be present as a result of the use of enriched flour.

(a) Although riboflavin has always been a required ingredient in enriched flour and bread, its compulsory addition was postponed until 1943 because the ingredient was scarce.

Postponement of Riboflavin: Fed. Register, Dec. 3, 1941, page 6176
Fed. Register, March 19, 1943, page 3358

FOODS ADDED FOR NUTRIENT

BY

NATIONAL RESEARCH COUNCIL, FOOD AND NUTRITION BOARD

(Proceedings: Vol. I, II, & III)

MILLING AND BAKING:

I, 1943 (Oct. 1) 1941 - Enrichment of flour and bread approved and adopted.

*III, 30 (Jan. 15) 1943 - Resolutions were made and adopted favoring immediate compulsory enrichment of all family flour; fortification of enriched flour and bread at levels recommended by the Board in 1941; and inclusion of riboflavin as a required ingredient in enriched flour and bread as soon as supplies are available.

*III, 1944 (July 30) 1942 - Food and Drug Administration's published proposals (in Federal Register, June 6, 1942) of revised standards for flour and bread enrichment were substantially in accord with the Board's views.

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*Especially as revised and published by the Food and Drug Administration are here given as taken from the following sources:

Flour Standards: Fed. Register, July 27, 1941, page 2590.
Fed. Register, July 8, 1942, page 1116.

Bread Standards: Fed. Register, June 7, 1941, page 2772.
Fed. Register, Aug. 8, 1942, page 10787

Units added per pound of flour

FLOUR	ENRICHED 1941 Minimum	ENRICHED 1941 Maximum	AMENDED 1943 Minimum	AMENDED 1943 Maximum
Thiamin	1.35 mg	3.7 mg	2. mg	2.5 mg
Niacin	5. mg	24. mg	16. mg	20. mg
Iron	5. mg	24. mg	13. mg	16.5 mg
(a)Riboflavin	1.0 mg	1.8 mg	1.2mg	1.5 mg
Calcium	500. mg	2000. mg	500. mg	625. mg
Optional (Vitamin D	250. USP	1000. USP	250. USP	1000. USP

(Flour may contain not more than 5 percent by weight of whole grain or partly defatted wheat germ.

Units added per Pound of Bread

BREAD	ENRICHED 1941 Minimum	ENRICHED 1941 Maximum	AMENDED 1943 Minimum	AMENDED 1943 Maximum
Thiamin	1. mg	4. mg	1.1 mg	1.0 mg
Niacin	4. mg	16. mg	10. mg	16. mg
Iron	4. mg	16. mg	8. mg	12.5 mg
(a)Riboflavin	0.5 mg	3.0 mg	0.7 mg	0.1 mg 1.0
Calcium	333. mg	1250. mg	340. mg	500. mg
Optional (Vitamin D	100. USP	400. USP	150. USP	750. USP

(Wheat germ food may also contain as an optional ingredient wheat germ or partly defatted wheat germ, but in no case is the total quantity thereof more than the maximum which may be present as a result of the use of enriched flour.

(a) Although riboflavin has always been a required ingredient in enriched flour and bread, its compulsory addition was postponed until 1943 because the impediment was scarce.

Postponement of Riboflavin: Fed. Register, Dec. 8, 1941, page 9176
Fed. Register, March 16, 1943, page 1556

FLOUR AND BREAD (continued):

III, 165 (May 27) 1943 (and III, 49 (Jan. 15) 1943) - It was resolved and adopted that priorities be established which will allocate sufficient skimmilk solids to permit universal compliance with Food Distribution Order No. 1 (III, 101 - providing for 3 parts skim milk solids per 100 parts flour in white pan bread), and for amendment of this order as soon as milk solids are available to provide for the addition of not less than 6 parts per 100 parts of flour in white pan bread. (It was also resolved that the maximum amount of sugar be raised to 6 parts per 100 of flour, and of shortening to 4 parts per 100.) The required increase in skim milk solid production is to be taken as a portion of skim milk now on farms and not being used for human food.

III, 323 (Oct. 7) 1943 - The possible addition of soybean flour to enriched flour was discouraged in fear that it may replace skim milk solids. (From Federal Register, August 3, 1943, page 10786 it is noted that soybeans in ground form may be added to plain bread, but not to enriched bread unless it is featured and so labeled.)

CORN PRODUCTS:

III, 50 (Jan. 14) 1943 - Resolution was adopted to enrich corn meal and grits in harmony with the enrichment program as soon as proper standards and techniques can be formulated.

III, 51 (Jan. 15) 1943 - Resolution was adopted that efforts be made to secure priorities for machinery and equipment necessary to enrich grits with thiamin, niacin, and iron.

III, 65 (Jan. 15) 1943 - Resolution was adopted that corn products be enriched to the level of enriched flour and that riboflavin be included. The following standards were stipulated on Jan. 15, 1943, and are to be effective so long as they remain consistent with the definitions for enriched flour and enriched bread:

	mgs. per pound	
	Minimum	Maximum
Thiamin	1.5	3.0
Niacin	16.0	32.0
Iron	13.0	26.0

Desirability of immediate enrichment of all corn grits and degerminated corn meal was expressed.

III, 324 (Oct. 7) 1943 - Resolution was adopted concerning desirability of developing insoluable salts or derivities of thiamin, riboflavin, and niacin capable of becoming fixed to the surface of corn grits and yet having resistance to rinsing.

RICE:

III, 324 (Oct. 7) 1943 - Resolution was adopted noting the desirability of the development of insoluable salts of thiamin, riboflavin, and niacin which are capable of becoming fixed to the surface of rice, yet have resistance to dissociation caused by rinsing. The tentative standard for enrichment which will be proposed to rice miller is:

	mgs. per pound	
	Minimum	Maximum
Thiamin	1.5	3
Niacin	16	32
Iron	13	26
Riboflavin, as an optional ingr. (0.5 would correspond to the natural content of brown rice.)	0.5	1

FOODS AND DRUGS (continued):

III, 160 (May 27) 1943 (and III, 45 (Dec. 14) 1943) - It was received and adopted that notice be given to specialty food manufacturers, sufficient minimum solids to permit uniform compliance with food standards Order No. 1 (III, 101 - provides for 7 parts milk solids per 100 parts ice cream in whole pounds). and for enforcement of this order as soon as milk solids are available to provide ice cream of not less than 6 parts per 100 parts of flour in milk per cent. (It was also resolved that the maximum amount of sugar be raised to 6 parts per 100 of flour, and of shortening to 3 parts per 100.) The required increase in milk solids production is to be taken as a portion of skim milk now or farm and being used for other uses.

III, 224 (Oct. 7) 1943 - The possible addition of soybean flour to enriched flour was discussed in view of the new particle size of milk solids. (See Minutes of Meeting, August 5, 1943, page 10000 at is noted that soybeans 17 percent flour is added to plain bread, not to enriched and unless it is required yet to be tried.)

FOOD PRODUCTS:

III, 40 (Dec. 14) 1943 - Dos Santos was allowed to market corn meal and grits in cartons, also the corn flakes, provided no claims be made for enriched, or fortified.

III, 80 (Jan. 17) 1944 - Resolution was adopted that dairies be made to secure priorities for machinery and equipment necessary to enrich grits with thiamin, niacin, and iron.

III, 3 (Jan. 10) 1945 - Resolution was adopted that corn products be enriched to the level of enriched flour and that rules be imposed. The following standards were established on Jan. 18, 1945, and are to be effective as long as the product complied with the difference for enriched corn flour and enriched meal:

	Mgs. per pound Minimum	Maximum
Thiamin	1.5	3.0
Niacin	10.0	20.0
Iron	13.0	26.0

Restriction of increase equivalent of all enriched grits and degerminated corn meal was approved.

III, 86 (Jan. 8) 1948 - Resolution was adopted concerning desirability of fortification with vitamin D or fortification of thiamin, riboflavin, and niacin capsules or according fixed to the surface of corn grits and corn meal having resistance to rancidity.

III, 224-4 (Oct. 7) 1949 - Resolution was adopted noting the desirability of the development of inexpensive milk of minerals, vitamin D, and vitamin which are capable of adsorbing fixed to the surface of grits, to have resistance to rancidation caused by storage. The minimum standard for enrichment with milk is proposed to be added to

	Mgs. per pound Minimum	Maximum
Thiamin	1.5	3
Niacin	10	20
Iron	13	26
Milk, as %	0.5	1

(0.5 equals corresponds to the natural amount of brown rice.)

FARINA:

III, 110-111 (May 27) 1943 - The Committee on Cereals reported that following the 1940 Hearings, standards for Enriched Farina have been the same as those for Enriched Flour except that no maxima were provided. In the forthcoming Hearings, set for April 19, proposals are made for specifications of maximum and minimum addition of required ingredients in amounts proposed for Enriched Flour. For the optional ingredients, calcium and vitamin D, the proposed levels are higher; but the making of optional ingredients into required ingredients was considered. Enrichment of other breakfast cereals was discussed.

*III, 193 (July 30) 1943 - The revision of standards for enrichment officially proposed by the Food and Drug Administration(printed in Federal Register, June 5, 1943) were substantially in accord with the Board's views.

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*Note - It was said that the revision of standards for enrichment of bread and flour, as pbulished June 5, was in accord with the Board's views. Enriched Farina was not mentioned, but it is thought by the compiler that approval of revised standards for it was implied or understood.

*Federal Register, June 5, 1943, page 7514 - Amendments to Title 21, Food and Drug Administration, Section 15.140 of May 27, 1941, state that the following standards are to be effective in the future for Enriched Farina:

Required Ingredients	Units per pound	
	Minimum	Maximum
Thiamin	2.0 mg	4.0 mg
Niacin	16.0 mg	32.0 mg
Riboflavin	1.2 mg	2.4 mg
Iron	24.0 mg	200.0 mg
Vitamin D	3200.0 USP units	

Optional Ingredient	Units per pound	
	Minimum	Maximum
Calcium	2000 mg	

TAKING:

III. 110-111 (May 27) 1945 - The Committee on Cereals reported that Milling one 1,000 bushels, obtained for Industrial Purposes during the year ended June 30, 1945 were found to be satisfactory. Milling and baking were satisfactory. In the Committee's opinion, and for April IV, cereals are made for quantities of vanilla or vanilla extract addition of grain into Superintendent is usually prepared for Combined Fin r. . for the optional ingredients, Milling and vitamin D. The required levels are 3, per, 1, 1 per pound of optional ingredients into required ingredients, mentioned. Performance of other breakfast cereals was satisfactory.

*III. 120 (July 20) 1945 - In revision of standards for breakfast cereals, officially presented by the Food and Drug Administration, published in Federal Register, June 5, 1945) were unanimously approved with one board's vote.

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*Note - If the April 2011 revision of standards for enrichment of bread and flour, as published item 3, was in agreement with the Board's views, detailed labels was not mentioned, but it is assumed by the committee that approval of revised standards for 3 was intended to be approved.

*Federal Register, June 5, 1945, page 7024 - Amendment 3 (Title 7). Food and Drug Administration, October 16,1945 at May 7, 1945. Note that the following standards are to be effective 12 to 18 months [illegible] Marina:

Required Ingredients	Units per pound	
	Minimum	Maximum
Vitamin	3.0 mg	4.0 mg
Niacin	10.0 mg	20.0 mg
Riboflavin	2.4 mg	3.4 mg
Iron	24.7 mg	300.0 mg
Vitamin D	300.0 USP units	

Optional Ingredients	Units per pound	
	Minimum	Maximum
Calcium	3000 mg	

MARGARINE:

*I, 193 (Oct. 1) 1941 - Resolution approving the addition of vitamin A to table fats was adopted. Standards were set by the Food & Drug Adm.

III, 99 (April 6) 1943 - Resolution was adopted that fortification of all oleomargarine intended for table use, as provided by regulations of the Food and Drug Administration (9.000 USP units of vitamin A per pound), would be in the interest of the American people.

III, 241 (July 30) 1943 - Previous recommendation of the Board that all margarine be fortified is reaffirmed.

MILK:

**I, 193 (Oct. 1) 1941 - Resolution approving the fortification of milk with vitamin D was adopted. Standards were set by the Food & Drug Adm.

II, 95 (Aug. 24) 1942 - It was moved and adopted that all relief milk contain vitamin D. For general distribution the amount should be 400 USP units per quart. If conditions do not permit a child to have one quart of milk daily, the unit which they do get may contain the 400 USP units of vitamin D, but in such circumstances the calcium intake may be inadequate. (Penny-milk is a relief milk.)

SALT:

I, 172 (July 26) 1941 - In a report submitted by Dr.Franklin C. Bing, it was stated that about 50 percent of table salt was being iodized. Iodized salt was introduced in 1924. Although the proportion of fortification had been higher, conclusion was reached that in the future one part of either sodium or potassium iodide to each 10,000 parts salt would be acceptable. This represents a percentage amount of iodide equal to 0.01 percent.

I, 193 (Oct 1) 1941 - Resolution approving the addition of iodine to salt for dietary use was adopted.

II,41 (June 7) 1942 - Revision was made in former proceedings to show that the iodine requirement is from 0.15 to 0.30 milligram per day per adult. This need is easily met by the regular use of iodized salt; its use is especially important in adolescence and pregnancy.

III,96 (March 5) 1943 - It was recommended that the need for iodized salt be brought more forcibly to the attention of the public. The Quartermaster General's Office gave assurance that all salt purchased for Army use, with the exception of salt tablets, will contain potassium iodide.

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* Federal Register, June 7, 1941, pp. 2763, Title 21 - Food and Drug, Chapt. I - Part 45, Section 45.000 - Oleomargarine; Identity; label statement of optional ingredients - describes oleomargarine as a plastic food and requires that it be prepared with one or more fat ingredients to include:

"(1) Vitamin A, added as fish liver oil or as a concentrate of Vitamin A from fish liver oil (with any accompanying Vitamin D and with or without added Vitamin D concentrate), in such quantity that the finished oleomargarine contains not less than 9,000 United States Pharmacopoeia Units of Vitamin A per pound."

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** Federal Register, July 2, 1940, pp. 2444, Title 21 - Food and Drugs, Chapt I - Part 18, Section 18.520 - Evaporated milk; identity; label statement of optional ingredients - describes evaporated milk as a liquid food which may contain one or both ingredients to include "(a)(2) Vit D in such quantity as increases the total Vit D content to not less than 7.5 USP Units per avoirdupois ounce of finished evaporated milk." It shall be labeled "with Vit D" and "(b)(4) Vit D content may be increased by application of radiant energy or by the addition of a concentrate of Vit D (with and

Sources) dissolved in food oil but not more than 0.01 % of total weight.

FOODS CONSIDERED FOR ENRICHMENT
BY
NATIONAL RESEARCH COUNCIL, FOOD AND NUTRITION BOARD
(Proceedings: Vol. I, II, & III)

MACARONI AND RELATIED FOOD PRODUCTS:

I, 193 (October 1) 1941 - Consensus of Committee on Fortification of Macaroni and Related Products was that the products concerned should not be fortified with vitamins and minerals. It was moved and adopted that this concensus be presented to the hearings of the Food and Drug Administration.

III, 323 (October 7) 1943 - Possible Fortification of Macaroni and Spaghetti was reviewed at the request of the Macaroni Manufacturing Association. The Committee on Cereals reported that it does not alter previous recommendations to the effect that the enrichment of macaroni is undesirable because of large losses by leaching in the cooking practices of the Italian population. This view was reported to the Food and Drug Administration.

EVAPORATED MILK:

III, 167 (May 27) 1943 - A report of experimental work with fortified evaporated milk in infant feeding was made to the Board by doctors who are carrying on independent research. A formula including fortifications of vitamins A, D, E, C, thiamin riboflavin, niacin, iron, copper and manganese is being given to 100 infants, and will be terminated in August. The need for such milk is said to be increased in war-time. Figures from a doctor of Johns Hopkins Hospital show that though childfen come to hospitals with many misjudged maladies, 50% of them have rickets and 12% have scurvy. At present machinery for such enrichment is available only on a laboratory scale.

III, 397 (December 6) 1943 - The possibility of further enriching condensed milk for foreign civilian diets was suggested.

SALT:

II, 126 (November 2) 1942 - Note was made of the recommendation from Dr. Carlson, University of Chicago, to the Committee on Medical Nutrition that table salt should be fortified with calcium, phosphorus, and possibly iron. The Board decided to refer this question to the Committee on Dietary Allowances.

MARGARINE(With vitamin D):

III, 307 (October 7) 1943 - At the Joint Food Committee of the United States, England, and Canada, Dr. Maynard spoke of the meeting of the Medical Research Council in England. The primary subject of discussion was the fortification of eleomargarine with vitamin D. The proposal was to fortify margarine with about ten times the amount now used, namely, 600 or 700 units per ounce. The purpose was to get all of the necessary vitamin D to children in their allowance of margarine which is 6 ounces per week. Although there were objections (especially to the expense of fortifying all margarine since vitamin D need by adult population is doubtful) the proposal was recommended for adoption.

FOODS CONSIDERED FOR ENRICHMENT
BY
NATIONAL RESEARCH COUNCIL, FOOD AND NUTRITION BOARD
(Proceedings: Vol. I, II, & III)

MARGARINE AND OTHER FOOD PRODUCTS:

I, 128 (October 1) 1941 - Consensus of Committee on Fortification of Macaroni and Related Products was that the products concerned should not be fortified with vitamins and minerals. It was moved and seconded that this consensus be transmitted to the Committee of the Food and Drug Administration.

III, 225 (October 7) 1942 - Possible fortification of Margarine and Shortening was reviewed at the request of the National Manufacturing Association. The Committee on Cereals reported that it does not alter previous recommendations to the effect that the enrichment of margarine is undesirable, because of large losses by leaching in the cooking practices of the Italian population. This view was reported to the Food and Drug Administration.

EVAPORATED MILK:

III, 167 (Nov 27) 1942 - A report of experimental work with fortified evaporated milk in infant feeding, was made to the Board by doctors who are carrying on independent research. A formula including fortifications of vitamins A, D, E, thiamin riboflavin, niacin, iron, copper and manganese is being given to 100 infants, and will be terminated in August. The need for more milk is said to be increased in wartime. Figures from a doctor of Johns Hopkins Hospital show that though children come to hospitals with many malignant malaise, 80% of them have rickets and 12% have scurvy. At present machinery for such enrichment is available only on a laboratory scale.

III, 397 (December 6) 1943 - The possibility of further enriching condensed milk for foreign civilian diets was suggested.

SALT:

II, 126 (November 2) 1942 - Note was made of the recommendation from Dr. Gerlaugh, University of Chicago, to the Committee on Critical Nutrition that table salt should be fortified with calcium, phosphorus, and possibly iron. The Board decided to refer this question to the Committee on Dietary Allowances.

MARGARINE(with vitamin D):

III, 307 (October 7) 1942 - At the Joint Food Committee of the United States, England, and Canada, Dr. Mayneord spoke of the meeting of the Medical Research Council in England. The primary subject of discussion was the fortification of oleomargarine with vitamin D. The proposal was to fortify margarine with about ten times the amount now used, namely, 600 or 700 units per ounce. The purpose was to get all of the necessary vitamin D to children in their allowance of margarine which is 4 ounces per week. Although there were objections (especially to the expense of fortifying all margarine since vitamin D used by adult population is doubtful) the proposal was recommended for adoption.

BAKING POWDER:

III, 3 (January 5) 1943 - Members are considering adding B vitamins to it, especially in the South where corn meal is eaten.

CHEWING GUM (With vitamin K):

III, 458 (December 6) 1943 - Continuation of a project which is being conducted by a professor of North Western University Dental School is recommended by the chairman of the Board's Survey on Dental Caries (but the Board will not take action on it).

ALCOHOLIC AND SOFT DRINKS:

I, 193 (October 1) 1941 - Resolution was adopted that the committee opposes the addition of synthetic vitamins to carbonated beverages.

III, 188 (July 13) 1943 - In a report to the Executive Secretary it was told that the use of grain for whiskey has been stopped since October 1942, that the use of corn for manufacturing alcoholic beverages was prohibited on July 10, 1943, and that the prohibited use of molases for manufacture of beverage spirits has practically stopped the manufacture of rum. The use of raisins, grapes and edible fruits for wine is prohibited. Table grapes and white grapes may be used 100 percent for wine. Brandy is still being made.

III, 184 (June 29) 1943 - Dr. Wilder, Chief, Civilian Food Requirements Branch wrote to the Chairman of the board advising that wine and beer carry significant nutritive value to justify their continued manufacture, perhaps on a limited scale.

III, 460-4 (December 6) 1943 - The board considers soft drinks a non-essential from the nutritional point of view.

III, 463-4 (November 5) 1943 - A general statement was made and adopted by the Board saying that soft drinks are the most dispensable items of the diet and that they are relatively non-essential from the nutritive point.

The committee pointed out, however, that soft drinks are not alone in this classification; some other foods are ades, nectars, drinks, candy, ice cream and ices (popsickles), syrups, flavors and powders for making beverages at home.

The Board thinks soft drinks may crowd out valuable foods from the diet, that they may dullen the appetite, and that there is no scientific evidence to show that they relieve fatigue.

CANDY:

I, 193 (October 1) 1941 - It was resolved and adopted that the Committee on Cereals opposes the addition of synthetic vitamins to confectionery.

III, 41 (January 15) 1943 - The National Research Council encourages improved nutritional quality of candy bars, but does not encourage the use by candies in general.

II, 130E (November 25) 1942 - A memorandum recommends the use of whey in powdered form for candy. (Whey contain 77% of the milk riboflavin, 26% of the calcium, and 50% of the iron, and various percentages of other valuable nutrients.)

CANDY (continued):

III, 397-401 (December 6,)1943 - Members of the Board do not consider chocolate bars to be the best conveyor of vitamins for fotifying diets of foreign feeding programs. The theobrimine of chocolate is too much for children two years and under, and, although the high fat content adds calories, there is an objection to it for pregnant women (III, letter after 446(October 25) 1943).

III, 463 (October 21) 1943 - Candy is classed by the Board in the foods considered relatively non-essential.

ICE CREAM:

I, 224 (December 17) 1941 - It was said that at the next hearings of the Food and Drug Administration, the question of enriching ice cream would likely present itself. If no one was there to speak in opposition, the Food and Drug Administration would be bound by the evidence. Recommendation was made that delegates of the Board be present at the hearings.

III, 463 (November 5) 1943 - In refusing to approve the enrichment of soft drinks, the Board pointed out that soft drinks are not alone in their classification as "most dispensible" items of diet. Ice creams and ices (including popsickles frequently referred to as a "drink on a stick") are in this classification and are not approved for enrichment.

SUGAR:

I, 224 (December 17) 1941 - Resolution was moved and adopted that the Board was not prepared to take action on the recommendation concerning enrichment of sugars. Further statement was made that consideration would have to be given to the resolution on enrichment which was adopted October 1, and to the progress of the flour enrichment program.

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FOODS CONSIDERED OR ADOPTED AS "ENRICHERS"
BY
NATIONAL RESEARCH COUNCIL, FOOD AND NUTRITION BOARD
(Proceedings: Vol. I, II, and III)

MILK SOLIDS:

III, 43 (January 15) 1943 - The Committee on Milk reported that approximately 5,769,000,000 pounds of skim milk powder, buttermilk powder, and whey powder are potentially available from the original equivalents now being fed to animals or wasted. (III, 70(January 14) 1943 -- Feeds which will replace milk, to some extent, for farm animals are: animal and fish by-products, alfalfa, and fermentation by-products containing the B-complex factors of milk.) Drying equipment is available to increase milk powder production 60 percent.

II, 130E (November 25) 1942 - Milk solids constitute unrivaled sources of calcium and riboflavin (the only elements of diet likely to be deficient in our national food supply).

III, 165 (May 27) 1943(and III, 49(January 15) 1943 - It was resolved and adopted that priorities be established which will allocate sufficient skim milk solids to permit universal compliance with Food Distribution Order No. 1 (III, 101--providing for 3 parts skim milk solids per 100 parts flour in white pan bread), and for amendment of this order as soon as milk solids are available to provide for the addition of not less than 6 parts per 100 parts of flour in white pan bread. (It was also resolved that the maximum amount of sugar be raised to 6 parts per 100 of flour, and of shortening to 4 parts per 100.) The required increase in skim milk solid production is to be taken as a portion of skim milk now on farms and not being used for human food.

II, 130E (November 25) 1942 - In a memorandum it was suggested that whey be powdered and included in candy and bakery products.

YEAST:

III, 401 (December 6) 1943 - Before the present war program began, two-thirds of the brewers' yeast produced went into animal feed.

Twenty-five million pounds of surplus brewers' yeast is potentially available annually. Less than half of this has formerly been dried for feeding stock. The supply of primary grown yeast can be doubled; this depends upon doubling the supply of beet molasses--which seems to be possible.

II, 142 (December 23) 1942 - Although it was resolved and adopted that yeast be excluded from list 1 (essential) of food classification, it was also resolved and adopted that reconsideration be made.

III, 42 (January 5) 1943 - Resolution was adopted that dry yeast be considered a natural food substance and be placed in class 1 (essential) of food listings for war-time, but that yeast concentrates be not included because of limited supply, variable composition, and low protein content.

III, 401 (December 6) 1943 - For the daily diet 2 to 4 teaspoonsfull of yeast a day will supply a good share of the B-vitamins.

YEAST (continued):

III, 253 (May 13) 1943 - The Medical Research Council of Great Britain gave a report of addition in mass feeding of yeast to soups, stews, and gravies with improvement in flavor. Consideration is being given to addition of yeast to curry stuffs, soya sauces, and flavorings in order to reach home diets as well.

III, 343 (September 14) 1943 - In an informal conference, viewpoints of various members of the Board were given in regard to food yeast. These suggestions to follow were offered on possible use of it:

(1) "Enricher" for corn meal in order to help solve the pellegra problem of the South.

(2) In doughnuts. Recommended proportions are 1/8 yeast, 1/8 soya flour, and 6/8 white flour.

III, 401 (December 6) 1943 - Committee on Food Yeast gave these suggestions for use of yeast:

(1) In doughnuts, yeast may replace flour up to $\frac{1}{4}$.

(2) In combination with meat products, in cookies, and up to 5 percent in bread.

(3) In yeast pellets it may be combined with skim milk, but not with cocoa (because of rancid flavor caused by the combination).

(4) Yeast does not combine with tomatoes or tomato products in cookery.

SOYBEANS:

*III, 404 (December 6) 1943 - The Food and Drug Administration's standards do not include soy flour among the several products other than wheat which may be added to white or enriched bread. Therefore, it is prohibited for use in the ordinary or enriched loaf, but can be used in feature leaves if properly labeled.

*III, 323 (October 7) 1943 - Since emphasis has been placed on the high protein value of soyflour, the Committee on Cereals reported a fear that it might replace milk solids if included as a constituent of enriched bread.

III, 308 (October 7) 1943 - An ad hoc Committee reported that the oil of soybeans contains only small amounts of carotene and little, if any, vitamin D.

III, 405 (December 6) 1943 - Soya is valuable chiefly for protein content. Its use as special food dishes, as meat extender, and in standard breads or specialty breads, is being explored by the Board.

III, 406 (December 6) 1943 - Although the Board considers the addition of 3 percent or less of an ingrdient to bread to be of no significance nutritionally, it was pointed out that soya was not a product approved for such addition.

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*From Federal Register, August 3, 1943, page 10786 it is noted that ground soybeans may be added to plain bread, but not to enriched bread unless featured and so labeled.

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PROGRAM ON ENRICHMENT
NOTED BY
NATIONAL RESEARCH COUNCIL, FOOD AND NUTRITION BOARD
(Proceedings: Vol. I, II, and III)

FOR DIETS OF WAR WORKERS:

III, 433-451 (October 16, 1943) - A study recently conducted at the Lockheed Plant on the effect of supplementing diets of war workers with vitamins by use of vitamin tablets shows that something definite was accomplished.

A new program will be carried on in ten plants located in different areas of the United States using gratis enriched refreshments at rest periods for fortifying diets. The program will be financed by the War Production Board and the War Department. A $112,000 contract by WPB has been drawn for supervision, collection of data, and educational campaigns. An undetermined amount of money is to be provided by the War Department for the purchase of vitamins, of food to be enriched, and of equipment. The estimated cost for vitamins, food, and equipment is 9 cents per capita per day, but after establishment it will be 7 cents.

FOR NUTRITION PROGRAM IN PUERTO RICO:

III, 159 (January 15) 1943 - Dr. Lydia J. Roberts made a report of the food and nutrition conditions in Puerto Rico.

III, 422 (December 6) 1943 - It is proposed that $50,000 per year be spent on a nutrition program in Puerto Rico.

FOR POST-WAR WORK ABROAD:

III, 320 (October 7) 1943 - The Rockefeller Foundation has given fellowships for training survey teams to serve as a nucleus for post-war work abroad. Since the middle of July, ~~Howard~~ Harvard School of Health has been training twelve young professional people. They will later spend one month in North Carolina where the International Health Division is conducting a Model Nutrition Survey. Then they will return to ~~Howard~~ Harvard for further study.

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EXCERPTS FROM
FOOD DISTRIBUTION ORDERS
DEPARTMENT OF AGRICULTURE
RELATIVE TO BAKERY PRODUCTS

*"F.D.O. 1, Part 1404--Bakery Products, Manufacture and Sale of Bread and Rolls. Section 1404.1--Manufacture and sale of bread and rolls--(a) Definitions (10) "Enriched" means that the bread has been made from enriched flour containing the ingredients in the quantities required by the regulations under the Food, Drug and Cosmetic Act, or that equivalent ingredients have been added to plain flour during the mixing of the dough. (b) Restrictions (9) All white bread shall be enriched, shall contain not less than 3 parts nor more than 4 parts of milk solids to 100 parts of flour, and shall be determined by weight of material used."

**"F.D.O. 1, Amdt. 5, Part 1404--Bakery Products, Manufacture and Distribution of Bakery Products. Section 1404.1--Restrictions on the manufacture and distribution of bakery products--(d) Enrichment--(1) No baker shall make or sell any yeast-raised bakery product (except biscuits and crackers), or any doughnuts, crullers, or fried cakes, unless enriched to the extent that white flour is used as an ingredient. (2) No person shall sell any imported yeast-raised bakery product (except biscuits or crackers), or any imported doughnuts, cruellers, or fried cakes, unless enriched to the extent that white flour is used as an ingredient."

***"F.D.O. 1, Amdt. 6, Part 1404--Bakery Products, Manufacture and Distribution of Bakery Products. Food Distribution Order No. 1, as amended (8 F.R. 16777) section 1404, issued by the Secretary of Agriculture on December 29, 1942, is further amended by deleting the period at the end of (d) (1) and substituting, in lieu thereof, the following: Provided, however, that until May 1, 1944, this requirement shall apply only to white bread.

"This order shall become effective at 12:01 a.m., e.w.t., January 16, 1944."

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*Federal Regiater, 7, December 31, 1942, Title 7--Agriculture, Chapter XI--Food Distribution Administration, (F.D.O. 1) Part 1404, Bakery Products, Manufacture and Sale of Bread and Rolls, pp. 11105.

**Federal Register, 8, December 15, 1943, Chapter XI--War Food Administration (Distribution Orders) (F.D.O. 1) (Amdt. 5), Part 1404--Bakery Products, Manufacture and Distribution of Bakery Products, pp. 16888.

***Federal Regiater, 9, January 15, 1944, Title 7--Agriculture, Chapter XI--War Food Administration (Distribution Orders) (F.D.O. 1, Amdt. 6), Part 1404--Bakery Products, Manufacture and Distribution of Bakery Products, pp. 599.